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## **Student's perception towards E-Learning**

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**KEY WORDS: E-Learning, Tools, Engineering, Students, Higher Education**

### **ABSTRACT**

Data regarding students' perception towards E-learning tools was collected through a survey and a focus group in different institutions (Scotland, England, Portugal) at different levels in Higher Education in the area of engineering. The purpose of this study was to have an understanding on students' perception towards E-learning tools as well for academics to reflect on how much effort has been made in including an innovative learning environment.

### **INTRODUCTION:**

Generation Z students, were born at the apex of technology and the internet; they have grown up around WiFi- laptops, video games, etc., so they are interactive, experts in technology and have high expectations of immediacy (Correia and Bozutti, 2017). Generation Z have also been defined as a unique and truly digital native generation of students born between the mid-1990s and 2012 (Seemiller, 2016); this means that they expect the incorporation of more technology in our teaching approaches, accompanied by more hands-on activities in classes (Malat, et al, 2015). However, since not all students belong to Generation Z, a more realistic approach is to refer to 'visitors' and 'residents' which is the term for digital users/online engagement (White and Le Courne, 2011). As academics, it is important to recognise the value of incorporating e-learning activities in our teaching in order to motivate students and provide them with an opportunity to interact and engage with peers in cooperative and collaborative learning.

## LITERATURE REVIEW / RATIONALE

Due to the evolution of technology e-learning tools are not been defined as a single term, and different researches refer to them as “an information system that can integrate a wide variety of instructional material” others as “technology intervention in the learning process” (Sun, et al, 2008 and Lee, et al, 2011). Students’ motivation and engagement in their learning process should be in constant review in order to enhance students learning experience. Motivation is an essential factor for students to learn and despite Generation Z students were born in the apex of a technological era and they expect the inclusion of technology as part of the teaching approaches (Correia and Bozutti, 2017), they also must have a positive attitude towards IT (Sun, et al, 2008). Previous research also highlighted that in order to provide a successful learning experience and make activities interesting to learners, proper and clear instructions must be provided (Keller and Suzuki 2010).

Technology Acceptance Model (TAM) allows to trace the impact of external factors on internal beliefs, attitudes and intentions. Figure 1 shows how the model works where behavioural intention to use (BI) is determined by the person’s attitude towards using system (A) together with its perceived usefulness (U), (Fred et al, 1989).

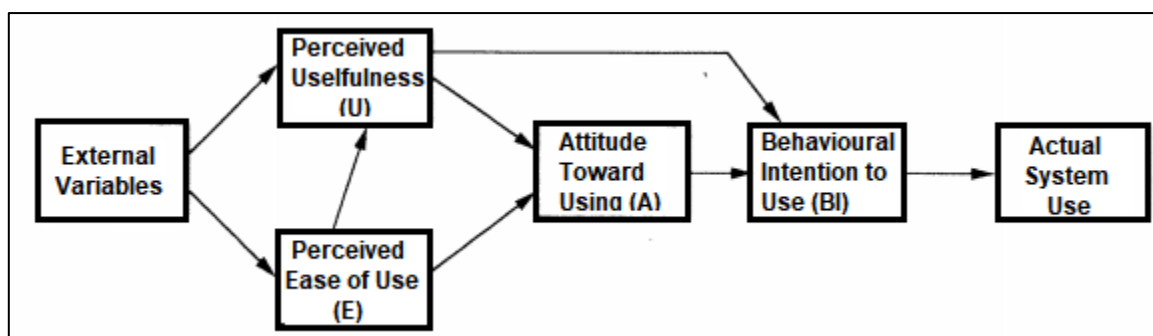


Figure 1. Technology Acceptance Model, TAM (Fred et al, 1989)

## AIM AND OBJECTIVES / RESEARCH QUESTION(S)

This study aimed to:

- Establish baseline of students’ perception of e-learning tools
- Academics to reflect on implementation of e-learning tools in their teaching practice.

## METHODOLOGICAL APPROACH

In order to collect information regarding students’ perception towards E-learning tools a survey for engineering students at different levels of mechanical engineering degree at four

different institutions was conducted. The survey was conducted to full time undergraduate students and to graduate apprentice students.

Table 1 and Table 2 shows number of participants and demographic details.

Table 1. Demographic details of participants in Full Time Education

<b>Level</b>		<b>Study</b>	<b># Students</b>	<b>University</b>	<b>Location</b>
1	1	Mechanical Engineering	50	A	Scotland
2	2	Mechanical Engineering	41	A	Scotland
3	3	Computer Aided Mechanical		B	Scotland
4	3	Mechanical Engineering	24	C	England
5	1	Integrated Master of Industrial Electronics Engineering and Computers	41	D	Portugal

Table 2. Demographic details of participants in Graduate Apprenticeship (GA) scheme

<b>Level</b>		<b>Study</b>	<b># Students</b>	<b>University</b>	<b>Location</b>
1	1	Mechanical Engineering	7	A	Scotland
2	1	Mechanical Engineering	5	B	Scotland
3	2	Mechanical Engineering	5	A	Scotland
4	2	Mechanical Engineering	5	B	Scotland

In order to further obtain and compare students' perception towards E-learning tools a focus group of 7 students in Level 2 from University A in mechanical engineering degree was also conducted.

The session lasted an hour and questions followed the TAM model as described in the literature review. Appendix A shows the questions involved

Table 3. Demographic details of participants in the focus group.

<b>Age</b>		<b>Gender</b>	<b>Student</b>
1	22	F	Erasmus
2	20	M	Home Student

3	19	M	Home Student
4	19	M	Home Student
5	21	F	Home Student
6	22	M	Home Student
7	21	M	Home Student

The focus group results were analysed following a qualitative approach. Limitations that should be considered are i) small number of respondent and ii) high degree of subjectivity.

## KEY FINDINGS

Results from the survey are observed in Table 4 for Undergraduate students and Table 5 for graduate Apprentice students

Table 4. Results from students at different levels in Full Time Education.

	Level			
	1 (UK)	2 (UK)	3(UK)	5 ( Europe)
Do you know what e-learning tools are?	Yes: 54% (27) No: 12% (6) Not sure 34% (17)	Yes: 63.7% (37) No: 36.2% (21) Not sure: 0% (0)	Yes: 37.5% (9) No: 12.5% (3) Not sure 50% (12)	Yes: 48.8% (20) No: - Not sure 51.2% (21)
Have you used e-learning tools in the past?	Yes: 54% (27) No: 38% (19) Not sure 8% (4)	Yes: 55.2% (32) No: 5.2% (3) Not sure: 39.6% (23)	Yes: 62.5% (15) No: 29% (7) Not sure: 0% (0) Not answered: 8.5% (2)	Yes: 48.8% (20) No: 0% (0) Not sure 51.2% (21)
Rate your e-learning tool likeability	1: 4% (2) 2: 2% (1) 3: 32% (16) 4: 34% (17) 5: 8% (4) Not answered: 22%	1: 0% (0) 2: 0% (0) 3: 50% (29) 4: 50% (29) 5: 0% (0) Not answered: 0%	1: 0% (0) 2: 4.2% (1) 3: 37.5% (9) 4: 25% (4) 5: 8.3% (2) Not answered: 25.2%	1: 0% (0) 2: 7.3% (3) 3: 29.3% (12) 4: 36.6% (15) 5: 22% (9) Not answered: 4.8%
3 most popular words to define e-learning tools	Free Accessible Fast	Practical Accessible Effective	Convenient Accessible Useful	Easy Accessible Fast
3 most popular	Need internet	Need internet	Need internet	Need internet

words to define worst things about E-learning tools	Confusing impersonal	Confusing impersonal	Self-discipline impersonal	Crash Slow
Name any E-learning tool you have used in the past	Blackboard: 32% (16) Others: (Moodle, Glow): 20% Not answered: 48% (24)	Blackboard: 56.8% (33) Others: Google classroom, e-conteudos: 12% (7) Not answered: 23.5% (12)	Blackboard: 42% (10) Others: (Khan Academy, BBC bitesize, Polley, other websites: 33% Not answered: 42% (10)	Blackboard: 56% (23) Moodle: 12% (5) Others: (Code academy, Khan academy: 14% (6) Not answered: 17% (7)
In scale 1 to 5, where 5 is the highest score, how important you think is to use E-learning tools	1:0% (0) 2: 21% (1) 3: 25%(6) 4:17%(4) 5: 1%(2) Not answered: 29% (7)	1:0% (0) 2: 5% (3) 3: 27.6%(16) 4: 53.4%(31) 5: 6.9%(4) Not answered: 6.9% (4)	1:0% (0) 2: 21% (5) 3: 25%(6) 4:17%(4) 5: 1%(2) Not answered: 29% (7)	1:0% (0) 2: 2.4% (1) 3: 10%(4) 4:31.7%(13) 5: 53.5%(22) Not answered: 2.4% (1)

Table 5. Results from Graduate Apprentice (GA) students at different levels.

	Level			
	1A (UK)	1B (UK)	2A(UK)	3B(UK)
Do you know what e-learning tools are?	Yes: 56% (5) No: 11% (1) Not sure 33% (3)	Yes: 40% (2) No: 20% (1) Not sure: 40% (2)	Yes: 89% (8) No: 11% (1) Not sure 0% (0)	Yes: 100% (7) No: 0% (0) Not sure 0% (0)
Have you used e-learning tools in the past?	Yes: 78% (7) No: 22% (2) Not sure 0% (0)	Yes: 40% (2) No: 60% (3) Not sure: 0% (0)	Yes: 78% (7) No: 11% (1) Not sure: 11% (1)	Yes: 71% (5) No: 29% (2) Not sure: 0% (0)
Rate your e-learning tool likeability	1: 0% (0) 2: 0% (0) 3: 0% (0) 4: 56% (5) 5: 33% (3) Not answered: 11%(1)	1: 0% (0) 2: 0% (0) 3: 60% (3) 4: 40% (2) 5: 0% (0) Not answered: 0%	1: 0% (0) 2: 0% (0) 3: 0% (0) 4: 67% (6) 5: 33% (3) Not answered: 0%	1: 0% (0) 2: 0% (0) 3: 43% (3) 4: 28.5% (2) 5: 28.5% (2) Not answered: 0%

3 most popular words to define e-learning tools	Easy	Practical	Convenient	Accessible
	Accessible	Accessible	Accessible	Convenient
	Convenient	Effective	Easy	Practical
3 most popular words to define worst things about E-learning tools	Need internet	Need internet	Need internet	Need internet
	Crash	Confusing	Crash	No Support
	Confusing	impersonal	Confusing	Crash
Name any E-learning tool you have used in the past	Blackboard: 44% (4) Maple TA: 33% (3) Not answered: 22% (2)	Moodle: 40% (2) Others:(Khan Academy, BBC bitesize: 40% (2) Not answered: 20% (1)	Blackboard: 56% (5) Maple TA: 44% (4) Not answered: 0% (0)	Moodle 86% (6) Others: Khan Academy, BBC bitesize: 50% (3) Not answered: 14% (1)
In scale 1 to 5, where 5 is the highest score, how important you think is to use E-learning tools	1: 0% (0) 2 11% (1) 3: 44.4% (4) 4: 33.3% (3) 5: 11% (1) Not answered: 0% (0)	1: 0% (0) 2 0% (0) 3: 20% (1) 4: 40% (2) 5: 20% (1) Not answered: 20% (1)	1: 0% (0) 2 0% (0) 3: 11.1% (1) 4: 33.3% (3) 5: 33.3% (3) Not answered: 22.3% (2)	1: 0% (0) 2 0% (0) 3: 14.4% (1) 4: 28.5% (2) 5: 57.1% (4) Not answered: 0% (0)

## DISCUSSION

From Tables 4 and 5, it can be observed that at least 37.5% of undergraduate students know what E-learning tools are, with a maximum of 81% of the students in undergraduate full time (Level 2) and 100% for GA at level 3, however this outcome does not seem to be very clear as when asking if they have used E-learning tools in the past 39.6% of students (Level 2), answered that they were not sure and 29% of GA students answered that they haven't used E-learning tools

When rating students' likeability towards e-learning tools, in general students' likeability was scored 3-4 out of 5 (being 5 highest score) for undergraduate and 4-5 for GA. This is

probably related to the fact that GA programme involves more distance learning, making students more prompt of using E-learning resources.

When asking students to provide 3 words to define e-learning tool, the most popular for all levels was accessible, fast and easy. When asking for 3 words to define worst thing about E-learning tools, the most popular were: internet dependency, impersonal and confusing. Having students including the word “confusing” as one of the most popular words to define worst thing about e-learning tools shows how important instructions are and how important this need to be clear for students to engage on the activity. This is in agreement with research conducted by Keller and Suzuki 2010.

From the Focus Group conducted to level 2 undergraduate students, 89% of the students felt that computers/laptops helped them to use E-learning tools and that they were great to use as these tools avoid arranging physical meetings as everything was done online, however it was highlighted the importance of reliable internet connection to undertake any task involving E-learning tools.

In regards to the usefulness of E-learning tools in engineering courses, 87% of the students agreed that if time is not an issue, assessment/activities involving E-learning tools will engage them, however 80% of the students prefer a blended approach as everything online can be an issue for some students (i.e. migraines). A positive thing is that by doing online activities, no paper is printed contributing to the environment.

Students highlighted that digital material is easy to download, the major problem is related to the submission process as 68% of students commented that they had doubts if the submission was conducted correctly due to lack of a notification of submission.

When discussing the attitude/enjoyment towards using e-learning tools, 35% of the students mentioned that using the word “enjoyment” was too strong as sometimes it can be ambiguous and is enjoyable only when the activity is 100% structured and no doubts are raised. Also 93% of students mentioned that a schedule for each activity was expected as this makes things easier and sometimes academics don’t provide this.

When students were asked to describe E-learning to a non-student (Behavioural Intention to Use), the majority described it as “E-learning is learning using internet; is like information in paper but online”.

When discussing if they could choose between E-learning approaches and face-to-face 100% of the students attending the focus group preferred face-to-face as they could ask questions and things were easier to take when meeting face-to-face.

## **Reflection**

Based on these results it is clear that when applying E-learning tools in students’ assessment it is important to highlight the tool been used and define it as an E-learning tool. It is also



important to keep in mind that instructions should be clear and well structure if we want students to engage and enjoy the activity.

## CONCLUSIONS & RECOMMENDATIONS

- E-learning tools are enjoyable if they are well explained, however 80% of the students would prefer a face-to-face approach
- 68% of the students have doubts if submissions have been done correctly as sometimes no notifications are received (internet/technology not trusted 100%).
- Students seemed not to be 100% clear on what E-learning tools are.
- The 3 most popular words defining E-learning tools are: accessible, fast and easy
- The 3 most popular words defining worst thing about E-learning tools are: internet dependency, impersonal and confusing.
- The Graduate Apprenticeship programme allows more involvement with online activities (E-learning tool) increasing students' likeability and recognizing its important towards them, especially at later years in their degree

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## **Appendix A**

### **Questions for Focus Group:**

#### **External Variables**

What sort of things help you use e-Technology?

What sort of things prevent you, like lack of time, no access to computers, etc?

Do you use e-Learning in all of your modules? How do you feel about that?

#### **Perceived Usefulness:**

Do you find eLearning useful to you in your course? Why / why not?

What's the biggest benefit to you in using eLearning approaches?

What's the biggest problem in using eLearning?

#### **Perceived Ease of Use**

Is eLearning easy for you? In what way?

Is it easy to access?

Easy to operate?

Easy to download and submit material?

#### **Attitudes Towards Using**

Do you enjoy eLearning? In what way?

Do you prefer other approaches? Which approaches / why?

Do you look forward to using eLearning tools? In what way / why not?

eLearning should be easy to access and use – is this the case for you? Describe that;

#### **Behavioural Intention to Use:**

So – if you were describing eLearning to a non-student, what would you say?

Would you recommend, to other lecturers, that they use eLearning? What would you say?

If you had to choose between eLearning approaches and face-to-face contact, which would you prefer and why?

#### **Actual System Use:**

Do you like the system used in this university (Moodle or Blackboard?)

What do you like best?

What would you change, if you could?

Any final comments?